

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Establish
Policies, Processes, and Rules to Ensure
Safe and Reliable Gas Systems in
California and Perform Long-Term Gas
System Planning

Rulemaking 20-01-007
(Filed January 27, 2020)

**REPLY COMMENTS OF THE CALIFORNIA HYROGEN BUSINESS COUNCIL ON THE
ORDER INSTITUTING RULEMAKING TO ESTABLISH POLICIES, PROCESSES, AND
RULES TO ENSURE SAFE AND RELIABLE GAS SYSTEMS IN CALIFORNIA AND
PERFORM LONG-TERM GAS SYSTEM PLANNING**

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I. Introduction

The California Hydrogen Business Council (CHBC)¹ welcomes the opportunity to provide the following reply comments to the *Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and Perform Long-Term Gas System Planning* (OIR), issued on January 27, 2020 in the above captioned proceeding. Our reply comments focus on two main issues:

- A. We agree with comments by Middle River Power and others that encourage the Commission to consider options for repurposing the gas system for decarbonized hydrogen and other zero carbon solutions, as a means of helping to advance California’s greenhouse gas reduction and carbon neutrality goals.**

¹ The CHBC is comprised of over 100 companies and agencies involved in the business of hydrogen. Our mission is to advance the commercialization of hydrogen in the energy sector, including transportation, goods movement, and stationary power systems to reduce emissions and dependence on oil. The views expressed in these comments are those of the CHBC, and do not necessarily reflect the views of all of the individual CHBC member companies. Members of the CHBC can be found here: <https://www.californiahydrogen.org/aboutus/chbc-members/>.

B. We support comments, such as those by SMUD, that call for more data driven analysis before drawing conclusions as far reaching as the future of the gas system.

These points are elaborated on in the Reply Comments section below.

II. Reply Comments

A. We agree with comments by Middle River Power and others that encourage the Commission to consider options for repurposing the gas system for decarbonized hydrogen and other zero carbon solutions, as a means of helping to advance California’s greenhouse gas reduction and carbon neutrality goals.

Middle River Power points out that “the existing gas delivery system also provides relatively low-cost optionality for the efficient delivery of biofuels and hydrogen, which may also play important roles in helping California achieve its decarbonization goals.”² Calpine similarly recommends that the Commission broaden the scope of Track 2 to consider alternative uses of the State’s natural gas infrastructure.³ Southern California Generation Coalition furthermore rightly asserts that “increasing injections of hydrogen and biomethane into gas utilities’ gas transmission systems could offset at least in part reductions in the transmission of natural gas caused by California climate change policies.”⁴ Southern California Gas Company, San Diego Gas and Electric,⁵ and Southwest Gas,⁶ likewise support using existing gas infrastructure for hydrogen and other alternative gaseous fuels to enable state goals to achieve carbon neutrality. CEERT recognizes that zero carbon resources have potential to improve energy system service, advance state climate goals and calls for the scope of questions to be expanded, so that zero carbon resources may be considered in both Tracks 1 and 2.⁷

Hydrogen, when produced with zero carbon feedstock, such as zero carbon electricity, organic waste derived biogas, and/or gasification of biomass, is a zero carbon resource. As such, it is capable of entirely eliminating lifecycle greenhouse gas from the gas system, in support of carbon neutrality and

² Pp. 2-3, Middle River Power Opening Comments on OIR

³ pp. 3, 8 Calpine Opening Comments on OIR

⁴ p. 13, Southern California Generation Coalition Opening Comments on OIR

⁵ pp. 2, 5, 9 Southern California Gas and Southern California Gas and Electric Joint Opening Comments on OIR

⁶ pp. 8-9 Southwest Gas Corporation

⁷ pp. 3-4, CEERT Opening Comments on OIR

carbon negativity goals.⁸ Displacing fossil natural gas with hydrogen and methanated hydrogen made from electricity or bio-based sources, along with biomethane, supports continued gas services that enable energy system resilience by not forcing complete reliance on the electricity system. Zero carbon hydrogen additionally supports decarbonization of hard to abate sectors like heavy duty vehicles and passenger vehicles where plugging in is not feasible, and industry for which zero carbon hydrogen can displace fossil gas derived hydrogen (e.g. in ammonia production) or decarbonize process heat (e.g. in cement or steel production). Hydrogen can moreover be used as a drop in zero greenhouse gas fuel for electricity generation in fuel cells or gas turbines. Gas turbines that take up to 30% blends are currently available, with 100% hydrogen turbines expected within a few years.⁹ Electrolyzers are also capable of demand response and other grid services that can help integrate high penetrations of renewables and because electrolyzers are highly scalable and modular, can produce massive amounts of hydrogen, which can provide grid scale long duration and seasonal energy storage, especially if the gas pipeline and subsurface storage infrastructure is utilized. We strongly encourage California to join other global frontrunner regions in Europe, Australia, New Zealand and Asia to carefully consider how to optimize the existing gas infrastructure for hydrogen.

B. We support comments, such as those by SMUD, that call for more data driven analysis before drawing conclusions as far reaching as the future of the gas system.

SMUD notes that to make good policy for the gas system's future, it is necessary to gain more clarity and collect a greater factual record about many assumptions, such as temperature based assumptions¹⁰ and risks "resulting from too aggressively shifting costs to current customers by overestimating the speed of the shift away from natural gas."¹¹ Gas utilities likewise point out that to establish reasonable gas system policies, studies that have identified renewable hydrogen as a key enabler of carbon neutrality and negative carbon neutrality (by Lawrence Livermore National Laboratory, Energy Futures Initiative, et al), among others, ought to be thoroughly vetted by multiple stakeholders, technical studies on hydrogen and other zero carbon gas must be undertaken.¹² Furthermore, the role of hydrogen in energy resiliency, carbon neutrality and achieving and clean air standards through the deployment of

⁸ See January 2020 LLNL study *Getting to Neutral*, referenced on p. 5 of Southern California Gas and Electric Joint Opening Comments on OIR

⁹ <https://www.businesswire.com/news/home/20180309005306/en/>

¹⁰ p. 4, SMUD Opening Comments to OIR

¹¹ p. 5, *ibid.*

¹² pp. 5-6 Southern California Gas and Southern California Gas and Electric Joint Opening Comments on OIR; We note also that a technical assessment on hydrogen blending limits is projected to be undertaken soon as part of the R1302008 hydrogen blending track.

hydrogen fuel cells should be considered.¹³ We fully agree with these comments. We strongly encourage continued efforts to support robust analytical efforts that can inform the energy and climate decisions facing the state.

However, we also caution against drawing stark conclusions from non-peer reviewed studies with decades-long time horizons that inevitably are highly speculative, uncertain and frame decisions as “either/or” – that pick one technology or pathway as a winner and prevent others from developing and contributing to the state’s climate, clean air, energy and resiliency goals. In view of this, we question NRDC’s and Sierra Club’s statement that it has been “determined” that in California, “reliance on hydrogen and synthetic natural gas would be extremely costly even under optimistic cost projections.”¹⁴ It is more accurate to say that this has been opined in one study, many assumptions of which have been seriously questioned by CHBC¹⁵ and others, who have called out gaps in the analysis and a need for further scientific inquiry to examine the issues raised.

Many global analysts, industry investors, and policy makers around the world have been projecting, on the contrary, that hydrogen is going to be essential for achieving economy wide carbon neutrality, as well as cost competitive with the right policies in place. In addition to the Energy Futures Initiative and Lawrence Livermore National Laboratory reports referenced above, a recent independently reviewed report by the Hydrogen Council, using real industry data to rigorously analyze 25,000 data points from 30 companies across the entire hydrogen value chain across four key regions (US, Europe, Japan/Korea, and China), found that the cost of hydrogen solutions is projected to fall by up to 50% by 2030 for a wide range of applications. This makes hydrogen competitive with other low-carbon alternatives and, in some cases, even conventional options.¹⁶ Dozens of major investments in low and zero carbon hydrogen projects are progressing around the world and demonstrating confidence in hydrogen’s future. 18 countries are integrating hydrogen roadmaps into their energy and climate policy planning.¹⁷

¹³ pp. 8,9,19, *ibid*.

¹⁴ p. 6, Sierra Club and Natural Resources Defense Council (NRDC) Opening Comments on OIR

¹⁵ <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-MISC-03>; For CHBC comments, see: *CHBC Comments - on E3’s Final Project Report, Natural Gas Distribution in California’s Low-Carbon Future*

¹⁶ Website for *Path to Hydrogen Competitiveness: A Cost Perspective*, Hydrogen Council; January 2020

<https://hydrogencouncil.com/en/path-to-hydrogen-competitiveness-a-cost-perspective/>

¹⁷ pp. vi. *Path to Hydrogen Competitiveness: A Cost Perspective*, Hydrogen Council; January 2020 https://hydrogencouncil.com/wp-content/uploads/2020/01/Path-to-Hydrogen-Competitiveness_Full-Study-1.pdf

NRDC and Sierra Club posit that “achieving carbon neutrality by 2045 will require much deeper gas demand reductions than contemplated by existing law,”¹⁸ based on the theoretical projection that building electrification will become widespread by 2045,¹⁹ which is based significantly on the prediction that heat pumps will become the heating technology of choice for California buildings.²⁰ However, such projections are based on very limited data and experience. As mentioned in our Opening Comments to this OIR, while we support electrification as a strategy for building decarbonization in some cases and end uses, we continue to caution against assuming that all electrification will or should be adopted in most or all buildings in California. The vulnerability of more than a quarter of California to wildfire related planned and unplanned shutoffs, the uncertainty of future gas and electricity pricing, the nascent market of key electrification technologies like heat pumps, and the difficulty of electrifying older buildings, are basic factors which individually or collectively could make decarbonized gas solutions more viable and cost effective for end uses in many if not most California buildings. Notably even cities like Berkeley that are banning gas for new construction are not requiring electrification for existing buildings in recognition of the difficulty and expense of installing heat pumps in older homes. Berkeley Councilmember Kathryn Harrison acknowledged at a Joint Agency workshop on building decarbonization that installing a heat pump in her old house was a “terrible experience,” due to the inherent structure of her home, and that in view of such types of limitations, the city is only focused on electrifying new construction.²¹ NRDC, Sierra Club and Wild Tree warn the Commission to consider the limitations of hydrogen and biomethane in considering the future of the gas system, while failing to also urge consideration of the glaring limitations and uncertainties of electrification. We think the Commission needs to be very careful about adopting policies based on such a one sided opinion and instead consider a larger body of data driven analysis that rigorously examines optimal scenarios and uncertainties for all these solutions and how they can best work in combination, not just in competition, and in different regions with different needs to secure a resilient, carbon neutral energy supply for all Californians.

¹⁸ p. 5, Sierra Club and Natural Resources Defense Council (NRDC) Opening Comments on OIR

¹⁹ p. 6 *ibid.*

²⁰ Sierra Club and Natural Resources Defense Council (NRDC) Opening Comments on OIR references heat pumps playing a major role in the declining need for gas on pp. 6 and 7

²¹ pp. 94-95, Transcript, April 8, 2019 Joint Agency Workshop on Building Decarbonization
https://ww2.energy.ca.gov/2019_energypolicy/documents/#04082019

Bloomberg New Energy Finance does not even see electrolytic hydrogen as distinct from electrification but indirectly as part of electrification, and predicts it playing a major role – almost as much as direct electrification of end uses – in European building energy, among many other applications by 2050, due to favorable economics and policies.²² In similar contrast to the comments shared by Sierra Club and NRDC, the comprehensive Hydrogen Council report cited previously shows that due to the expected falling costs of hydrogen, where existing gas and boiler infrastructure is used, hydrogen boilers and boilers that combine hydrogen with small heat pumps will be cost competitive by 2030 with biomethane and heat pumps in new construction, and nearly the same cost as natural gas boilers.²³ Heat pumps in existing buildings, however, are shown to be far more expensive.

In view of such analyses and the early stage of market development for a range of decarbonization technologies, we support not only further rigorous scientific study of optimal scenarios for California, but pilot programs, as Southern California Gas and San Diego Gas and Electric recommend,²⁴ that demonstrate a diverse range of complementary technologies, such as electrolytic hydrogen that helps manage curtailment of renewable electricity generation, and fuel cells in microgrids and residential applications that may also include onsite solar and batteries. We think California should be focusing not only projects that deploy heat pumps, but also on innovative projects like the residential block in Rotterdam that is heating homes with 100% renewable hydrogen produced onsite and distributed through a methane pipeline that has been converted to transport hydrogen.²⁵ We also believe it is critical to build flexibility into planning rather than make major decisions on the future availability of the gas system that could prematurely lock Californians into a less diversified set of options for achieving a reliable, carbon neutral energy system.

IV. Conclusion

The CHBC thanks the Commission for the opportunity to submit these comments and looks forward to working with you to establish better understanding of the essential role of hydrogen and its derivatives in enabling state climate, clean air, clean energy and resilience goals and in future gas system planning.

²² p. 17, *Sector Coupling in Europe: Powering Decarbonization*, BNEF; February 2020

<https://data.bloomberglp.com/professional/sites/24/BNEF-Sector-Coupling-Report-Feb-2020.pdf>

²³ p. 51, *Path to Hydrogen Competitiveness: A Cost Perspective*, Hydrogen Council; January 2020 <https://hydrogencouncil.com/wp-content/uploads/2020/01/Path-to-Hydrogen-Competitiveness-Full-Study-1.pdf>

²⁴ p. 19, Southern California Gas and Southern California Gas and Electric Joint Opening Comments on OIR

²⁵ <https://www.dnvgl.com/oilgas/perspectives/heating-dutch-homes-with-hydrogen.html>

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Respectfully submitted,

A handwritten signature in blue ink, appearing to read "Emanuel Wagner", with a long horizontal flourish extending to the right.

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